

instantaneously, sticking to the fingers in a very disagreeable manner; it has a strong odour, resembling that of peaches, and affects very disagreeably the mucous membrane of the nostrils, causing a strong itching.

Phyllomedusa dacnicolor, Cope.

The size of this species was believed to be that of *Hyla arborea*. Several specimens, brought home by Mr. Forrer, show that it attains to a very large size, viz. 83 millim. from snout to vent. The habits are those of *Hyla cærulea*, which this frog resembles in size, general proportions, and colour. The faculty of opposing the inner finger and toe is conspicuous, though less so than in the typical species of *Phyllomedusa*. The colour of the upper parts is normally bright green, but rapidly changes to olive or brown; white dots are scattered on the flanks; the lower parts are pure white; the two inner fingers, the three inner toes, the lower surface of the hands and feet, and the sides of the limbs are yellowish pink. The iris is black, vermiculated with gold; a golden line borders the vertical pupil. The nictitating lid is veined with gold, and the lower eyelid completely opaque, green.

MISCELLANEOUS.

On the Sexuality of the Common Oyster (Ostrea edulis) and that of the Portuguese Oyster (O. angulata). Artificial Fecundation of the Portuguese Oyster. By M. BOUCHON-BRANDELY.

TWENTY or twenty-five years ago the Portuguese oyster, which is indigenous to the Tagus, did not exist on the coasts of France. It has been acclimatized in our waters quite accidentally. A ship coming from Portugal, having suffered damage, had to discharge its cargo in order to undergo repair. The oysters which it carried were thrown into the Gironde, upon the old Banc de Richard. Meeting there with conditions favourable to their propagation, they multiplied at such a rate that from Pointe de Grave to Richard, over an extent of from 25 to 30 kilometres, they now form a vast bed, the breadth of which will soon be limited only by the banks of the river.

The sexuality of this oyster differs essentially from that of the other kinds of oysters common to our waters, of which the most wide-spread is *Ostrea edulis*: this is hermaphrodite, as Lacaze-Duthiers, Coste, Davaine, Möbius, Eyton, Hart, and many others have proved. Is it a self-sufficing hermaphrodite? With respect to

this, nothing has yet been quite demonstrated. Considering that the genital gland rarely presents the two sexes at the same degree of maturity, it is probable that it does not fecundate itself.

The Portuguese oyster, on the contrary, is unisexual. That is incontestable. We have opened a great number of them, taken at all the phases of the reproductive period; and all were either exclusively males or exclusively females.

On the other hand, contrary to what takes place with the common oyster, in which fecundation is accomplished within the valves, the ova are expelled from the shell; it is in the bosom of the water that they meet with the fecundating element. In fact neither ova nor embryos are ever found in the mantle of *O. angulata*. This is moreover corroborated by the fact that the ova and embryos of the Portuguese oyster are developed in the pure sea-water, while those of the common oyster, at least during the whole period of the gestation of the ovum and till the moment when the embryo abandons the maternal shelter, cannot live out of the liquid contained in the shell, which liquid, according to an analysis made in M. Berthelot's laboratory, contains a notable proportion of albumen. In vain we tried to preserve, in sea-water aerated and renewed, any embryos of *O. edulis* to complete development, whether they were in the state of *white* or of *grey* spat: the white embryos succumbed after two or three days, the grey ones after twelve or fifteen, although they had within reach collectors to which they could attach themselves.

These facts constitute an essential difference between the two species, which excludes every hypothesis of crossing and must cause the rejection of the theory of hybridation advocated by some ostreiculturists. We have moreover made some direct experiments at hybridation, which issued in a negative result. Thus, at different times during last year and this, we placed ova from Portuguese oysters in contact with zoosperms taken from common oysters, and conversely; but never, under the conditions of our experiments, have the elements naturally and instinctively come together, never has there been any trace of fecundation or development.

The sexual elements of *O. angulata* being, as we have said, clearly separate, we had a glimpse of the possibility of accomplishing artificial fecundation. The example of Brooks, of Baltimore University, who made successful attempts at artificial fecundation with *Ostrea virginiana*, was also encouraging.

After much feeling our way, we adopted the following method. With a little practice, it is easy to distinguish the sexes with the naked eye. By means of a camel's-hair pencil we detach the ova from the ovary, and deposit them in a vessel filled with sea-water—a phial, for example. In order to disaggregate them and clear them from the foreign matters with which they may be encompassed, the phial is agitated for a few moments, and then the liquid allowed to settle. The ova which are fit for fecundation sink to the bottom of the vessel; what remains in suspension must be eliminated. The liquid is decanted, and fresh sea-water poured in; and it is sufficient to add a small portion of seminal liquor in order that the

ova may be directly and closely surrounded by the zoosperms; the first phases of fecundation commence immediately.

The ova and spermatozoids can, without being placed in contact, preserve their vital properties in the water for several hours. Our best fecundations were obtained with elements which did not come together until two or three hours after their extraction from the genital glands.

We shall not describe the first phases of the development of the ova; but we think we must record a fact which, we believe, has not before been observed: the embryos of *O. angulata* begin to move from seven to twelve hours after fecundation, according to the temperature. At Verdon we obtained some in seven hours, the water having a temperature of 22°. Their mobility was exhibited in rotatory and gyratory movements. Sometimes they turn on the spot as on a pivot; at others they remove rapidly and shoot like a dart across the field of observation. The shell is formed at about the sixth or seventh day after the impregnation.

The artificial fecundation presents no difficulty of execution; it ends, four times out of five, in the formation of a mobile embryo, if the elements employed are good. With the Portuguese oyster the laying is effected gradually, and sometimes lasts several weeks. When a speck in the genital gland becomes transparent, it is because the elements are ripe; and it is then that they can be employed with advantage.

In consequence of the preceding, and seeing the fecundity of the oyster of the Tagus*, we tried some practical applications. For this purpose we prepared at Verdon a "clear" of 100 square metres surface, into which we poured the animated products of various artificial fecundations. The difficulty was to preserve the embryos while at the same time securing the renewal of the water. We attained that result by making the water enter and flow away through a bed of fine sand.

After a month of reiterated experiments our endeavours were crowned with success. We had the satisfaction of finding some brood fixed on each of the tiles placed in our experimental "clear." This is so much the more remarkable as, until last week, none had yet attached themselves to the numerous collectors immersed on the oyster-beds of the Gironde—that is to say in the very centre of the "clear."—*Comptes Rendus de l'Académie des Sciences*, July 31, 1882, t. xcv. pp. 256-259.

On a Synthetic Type of Annelid (Anoploneis Herrmanni) a
Commensal of Balanoglossus. By M. A. GIARD.

The rich sandy beaches of the Iles Glénans, especially those of

* 1 cubic centim. of ovary contains	Ova.
By dissociation	2500000
By sections	5200000

Mean..... 3850000

The volume of the ovary of an oyster of average size varies between 6 and 8 cubic centim.